



## MALAYSIA

# CERTIFICATE OF GRANT OF A PATENT

In accordance with section 31 (2) of the Patents Act 1983 a patent for an invention having grant  
Number .....**MY-104766-A**.....  
has been granted to.....**MCNEIL-PPC, INC.**.....

in respect of an invention having the following particulars:

Title ..... PANTS LINER FOR ATTACHMENT DIRECTLY TO OUTER GARMENT .....

Filing Date 22 NOVEMBER 1990

24 NOVEMBER 1989  
Priority Date .....

Name of Inventor ..... DAVID HUJBER and BETH STERN .....

Name of Patent Owner .....MCNEIL-PPC, INC.

Address..... VAN LIEW AVENUE, MILLTOWN, NJ08850,

UNITED STATES OF AMERICA

31 MAY 1994  
Date of Grant.....

Dated this 31 day of MAY 19 94.

(MOINUDDIN BIN IBRAHIM)  
for Registrar of Patents  
MALAYSIA

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**(12) MALAYSIAN PATENT****(11) MY - 104766 - A**

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**(21) Application No:** PI 9002063**(22) Filing Date:** 22 November 1990**(47) Date of publication and grant:**

31 MAY 1994

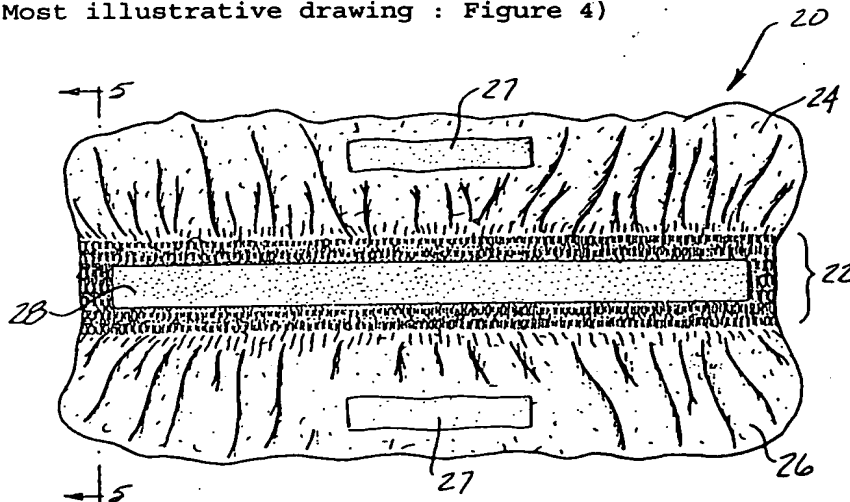
**(30) Priority Data :**  
440,843, 24 Nov. 1989; US**(51) Classification INT CL 5 :**  
A61F 13/15  
A41H 27/00**(56) Prior Art:**  
US-A- 4,667,538  
US-A- 4,351,340  
US-A- 4,347,092**(72) Inventors:**  
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**(54) Title:** Pants Liner for Attachment Directly to Outer Garment**(57) Abstract:**

Comformable, absorbent articles for use in the crotch portion of a garment having tubular leg portions are disclosed which are used to make pants liners (20) which may be attached directly to an outer garment, such as a pair of slacks (10). The present invention discloses pants liners which may be worn when the user does not wear an undergarment. In a preferred embodiment, a fabric structure is provided having a centrally disposed longitudinal portion (22) which has been microcreped, i.e., a series of small convolutions have been formed in the fabric. Extending laterally from the microcreped portion are conformable ruffled portions (24, 26) which conform to the crotch portion of a garment, and lie along the inner surface of the leg portion without undue bunching or folding. Methods of making such liners are also disclosed.

(Most illustrative drawing : Figure 4)



PANTS LINER FOR ATTACHMENT  
DIRECTLY TO OUTER GARMENT

5       The present invention relates to feminine hygiene products and more specifically to pants liners which are attached to an outer garment, such as a pair of slacks or panty hose or the like inner garment.

10      BACKGROUND OF THE INVENTION

Complete hygienic and sanitary protection frequently includes the use of thin absorbent structures commonly known as panty shields or panty liners. These products are typically used either in conjunction with catamenial  
15      tampons during menstruation to absorb excessive exudates or, alternatively, are worn during other phases of the menstrual cycle to absorb small quantities of menstrual, urinary or other fluids. The purpose of such panty liners is to absorb these body fluids and prevent them from  
20      staining both the wearer's undergarments and, more importantly, other garments which conform to the perineal area. Examples of such garments are slacks, shorts, dancing and gymnastic tights, and stretch pants.

25       Normally, panty liners are provided with adhesive means which affixes the garment facing surface of the panty liner to the user's undergarment and holds it in position. This type of fastening system ensures that the absorbent, body facing side of the panty liner contacts  
30      the perineal area of the user. For various reasons, however, the outer garments listed above may be worn in direct contact with the user's body, that is, the user does not wear an undergarment. In this situation, the panty liners found in the prior art cannot be used  
35      effectively. Usually, the crotch portion of a garment,

such as a pair of slacks, comprises two separate tubular sections into which the legs are inserted. These sections are then joined to form a curved crotch section. The shape of the garment in the crotch region therefore does not present a flat surface, curved against the user's body, as would be found in an undergarment. Instead, a ridge is essentially formed at the juncture of the two sections. A flat panty liner having strips of adhesive cannot be effectively conformed and adhered to the compound curves this surface presents. For this reason, presently, the sanitary protection and discretion provided by a panty liner is not available while wearing those outer garments wherein it is desired to not wear an undergarment.

Thus, a need exists within the absorbent personal products art to provide an absorbent structure capable of conforming to the inside surfaces of the saddle-like crotch portion of a pair of slacks, panty hose, or the like. Moreover, as demonstrated above, it would be desirable to provide a panty liner which would provide sanitary protection when undergarments are not worn.

#### SUMMARY OF THE INVENTION

Accordingly, it has now been found that by forming a series of small convolutions along a central portion of an absorbent structure by compacting, using techniques such as (but not limited to) microcreping, a conformable structure results.

In a preferred embodiment, a fabric comprised of rayon and polyester is microcreped along a central portion. The laterally extending portions remaining take on a ruffled appearance. When the creped portion is disposed along the crotch seam of an outer garment, the

laterally extending portions conform to the inner leg portion, thus effectively lining the garment. Most preferably, adhesive means are provided for attaching the panty liner to the outer garment.

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The methods provided by the present invention preferably comprise providing an absorbent structure, forming a creped portion therein and affixing adhesive means to the resulting conformable structure. Most preferably, a thermosetting microcreping process is used, whereby the absorbent structure is compressed between about 8% to about 30%, but in any case less than about 50%.

#### BRIEF DESCRIPTION OF THE DRAWINGS

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FIG. 1 depicts a typical pair of slacks which might be worn without undergarments.

FIG. 2 is a side view of the slacks shown in FIG. 1.

FIG. 3 is a diagram of the geometric construction of an outer garment which has separate tubular legs.

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FIG. 4 is a plan view of the conformable structure of the present invention laid flat in a plane.

FIG. 5 is a cross-sectional view of the structure of FIG. 4 taken along line 5-5.

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FIG. 6 is a perspective view of a panty liner made in accordance with the present invention.

#### DETAILED DESCRIPTION

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Referring to FIG. 1, there is illustrated a typical pair of slacks 10 in which the pants liner of the present invention will find application. Although the garment illustrated is a pair of short slacks, full length slacks or other styles of garment having a separate tubular portions 12,14 for each leg may be worn without an undergarment while using the panty liners of the present invention. As shown in phantom, the crotch portion of

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such undergarments is essentially the intersection of two curves. These curves are designated "X" and "Z" in FIG.

1. By observing this construction, one of ordinary skill will comprehend that a conventional panty liner cannot be effectively adhered to the inner surface of such a garment 5 since the seam or region in the vicinity of line "X" is essentially a ridge.

As shown in FIG. 2, the ridge formed by line "X" is 10 curved to follow the crotch, and merges with the substantially cylindrical surface of the pant leg 12. If a conventional flat panty liner were folded along a longitudinal axis, the resulting folded structure could not effectively conform to the curve of "X" while lying 15 relatively flat along the inner surface of the tubular portions 12,14 of the slacks 10, largely because most absorbent materials do not have sufficient elastic properties to achieve this configuration without folding or bunching.

20 A simplified diagram of the construction discussed above is illustrated in FIG. 3. Line "X" corresponds to the longitudinal axis of a panty shield. It is clear that an essentially planar structure could not conform to the curve of line "X" and then be folded along the plane of 25 line "Z". Alternatively, as pointed out with reference to FIG. 2, it would be difficult to force an essentially flat structure to follow the curve of line "Z" and conform the longitudinal fold line to line "X" as well without 30 bunching or folding.

It has now been found, however, that a conformable structure can be manufactured which fulfills the need unmet by the prior art. The present invention provides a 35 substantially flat absorbent structure which may be

applied to the crotch area of a pair of pants and folded or draped down the tubular leg portion without exhibiting a tendency to unduly bunch or fold. Thus, the conformable structure disclosed herein permits the construction of  
5 panty liners and the like which may be directly attached to outer garments, allowing the user to dispense with wearing an undergarment disposed between the outer garment and panty liner.

10 Referring now to FIG. 4, a panty liner 20 made in accordance with the present invention is illustrated. Although a substantially rectangular pants liner is illustrated, one of ordinary skill will realize that numerous alternate outline shapes may be constructed. For  
15 example, elliptical, hourglass-shaped or liners having laterally extending portions may be made. A central portion 22 of the liner 20, is treated to form a "microcreped" structure. Microcreping, as used herein, encompasses any process by which a series of convolutions are formed in an absorbent structure. Most preferably,  
20 the microcreping process used is a thermosetting process. As will be easily understood by those of ordinary skill, microcreping thus involves the formation of a plurality of relatively small folds or convolutions in the structure comprising the liner 20. Extending laterally from the  
25 central microcreped portion 22 are ruffled portions 24, 26. These ruffled portions are also convoluted, but to a lesser degree and merely as a result of the microcreping process performed on the central portion 22.

30 The present invention may be used with a variety of fabrics or absorbent stock. For example, roll stock of approximately 67.8gm/m<sup>2</sup> comprised of rayon and polyester produces good results. Other fabrics may also  
35 be used, depending upon parameters such as the degree of

absorbency desired and the microcreping equipment used. In the embodiment illustrated, a 2.54cm wide strip was microcreped down the enter of a 30.48cm wide fabric. The polyester was thermally stabilized during the creping process. This material was then cut into samples about 12.7cm wide and 20.32cm long. Most preferably, the microcreping process is a compressive treatment process. This process can be implemented, for example, using a MICREX/ Microcreper, supplied by the Bird Machine Company, Inc. of South Walpole, Massachusetts, U.S.A. Preferably, the maximum amount of compaction resulting from this process is less than about 50%. In a most preferred embodiment, the compaction is between about 8% to about 30%.

As shown in Fig. 5, the microcreped fabric which forms the conformable structure of the present invention will comprise alternating portions of convoluted and compressed areas within the central microcreped portion 22. The laterally extending portions 24, 26 are preferably not compressed to any great extent. It may also be observed in FIG. 5 that a most preferred embodiment of the present invention comprises a single thickness fabric structure. It will be understood, however, that other layers of materials may be incorporated into the present invention. For example, absorbent layers, fluid repellent layers or both may be laminated to form an absorbent structure. The resulting structure may then be microcreped and otherwise formed to result in a panty liner made in accordance with the present invention. As well known to those of ordinary skill, the microcreping process may be applied to paper webs, woven fabrics, non-woven fabrics, or laminates made from one or more of these materials. Moreover, any of these materials may be chemically or otherwise treated to increase either



absorbency or hydrophobicity, depending upon whether the application of such treatment is to be garment facing side or the body facing side of the panty liner.

5           In a preferred embodiment of the present invention, a pants liner 20 formed, as illustrated in FIG. 5 by first trimming the sample to provide rounded corners and otherwise provide a finished shape. Adhesive strips 27,28 are then applied to one side of the finished pants liner  
10 20. Most preferably, the adhesive strips 27,28 are covered with release paper.

          Referring now to FIG. 6, there is illustrated a perspective view of the panty liner 20 depicted in FIG. 5,  
15 showing its configuration when emplaced in the crotch portion of an undergarment. The liner 20 is placed over the central seam of the garment such that the creped portion 22 lies directly on the seam and is thus aligned with the perineal area of the user. The laterally  
20 extending ruffled portions 24,26 are placed against the inner surface of the leg portion and lie substantially in conformance therewith. It should be noted that a panty liner of this type may be constructed to cover a greater length of the crotch than a conventional panty liner so  
25 that urinary, anal and menstrual fluids are absorbed.

          Thus, as the creped portion 22 of the panty liner 20 is pressed against the curved crotch seam ("X" in FIGS. 1-3), the laterally extending portions 24,26 fall to the  
30 inside of the pant legs, the ruffles created by the creping process are forced to open and expand. The present invention therefore provides a simple approach to producing a product, or component of a product, which conforms to the curved crotch area of a pair of slacks or  
35 the like.

The foregoing description of a preferred embodiment has featured microcreping as the mode of manufacture, and has used the term "creped" with respect to that process.

5 It will be apparent, however, that other methods will be preferable to various individuals skilled in the art, yielding a like product. Heat shrinkable materials are known, in which selective application of heat energy will cause local shrinking. For example, bicomponent fiber and

10 fiber blends are available which work for this application. In the event that the embodiment of Figure 4 should be produced in accordance with this technique, local application of shrinking heat would occur at the creped portion 22, while the remainder of the product is

15 not subjected to such heat, whereby the ruffled portions 24 and 26 would be produced. It will be apparent that this technique may be applied with or without a fluid impervious barrier on the side opposite the body facing side of the pants liner 20. That is, numerous heat

20 shrinkable fluid impervious films, such as polyethylene, are known which exhibit heat shrinkable characteristics and which may readily function with previously described absorbent materials. Preferred materials of this class are those set forth in U.S.S.N. \_\_\_\_\_, filed

25 October 7, 1989, entitled "Heat Shrinkable, Elastic, Glueable Polyethylene and Ethylene Vinyl Acetate Film". That application describes two and three layered films of polyethylene and ethylene vinyl acetate copolymer which is suitable for embodiments of the present invention.

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Accordingly, as utilized herein, the term "creped" refers to the selectively gathered and ruffled structure as shown and described herein, without limitation to the precise method of manufacturing (except, of course, where

35 such method is expressly stated as a limitation).

Although certain embodiments of the present invention have been described in detail, one of ordinary skill will understand that the invention disclosed herein is not so limited and numerous modifications and other embodiments are apparent. Accordingly, reference should be made to the appended claims in order to determine the full scope of the present invention.

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What is claimed is:

1. A conformable, absorbent article for use in the crotch portion of a garment having tubular leg portions, wherein a portion of the structure has been creped, whereby the portions extending from said creped portion substantially conform to the crotch portion of a garment having separate tubular leg portions.

2. The conformable structure of claim 1, wherein the structure comprises a fabric comprising rayon and polyester blend.

3. The conformable structure of claim 2, wherein the fabric is roll stock of approximately  $67.8\text{gm/m}^2$ .

4. The conformable structure of claim 1, wherein creped portion is a relatively narrow longitudinal strip, and the portions extending therefrom are relatively wide symmetrical portions laterally extending from each side.

5. The conformable structure of claim 4, wherein said creped portion is about 2.54cm wide and the portions extending therefrom are about 5.08cm wide.

6. The conformable structure of claim 1, wherein the portion of the structure which has been creped is compressed less than about 50%.

7. The conformable structure of claim 6, wherein the portion of the structure which has been creped is compressed between about 8% to about 30%.

FIG-1

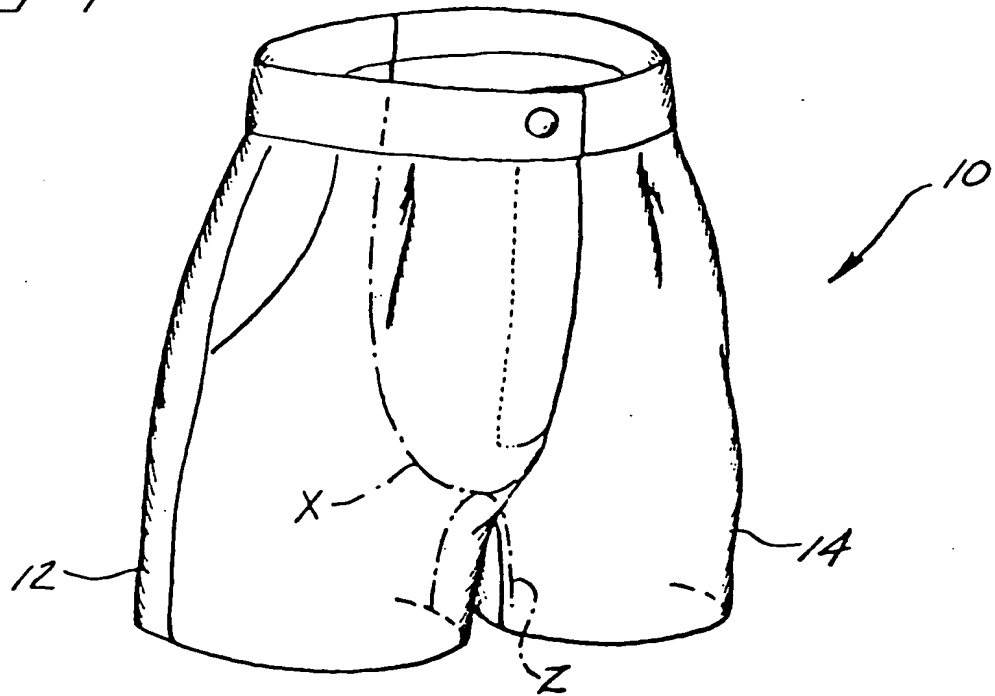


FIG-2

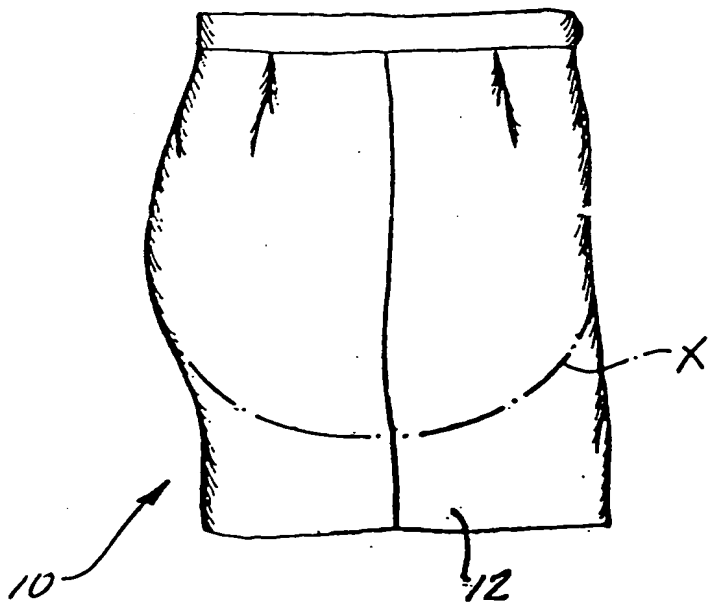


FIG-3



FIG-4

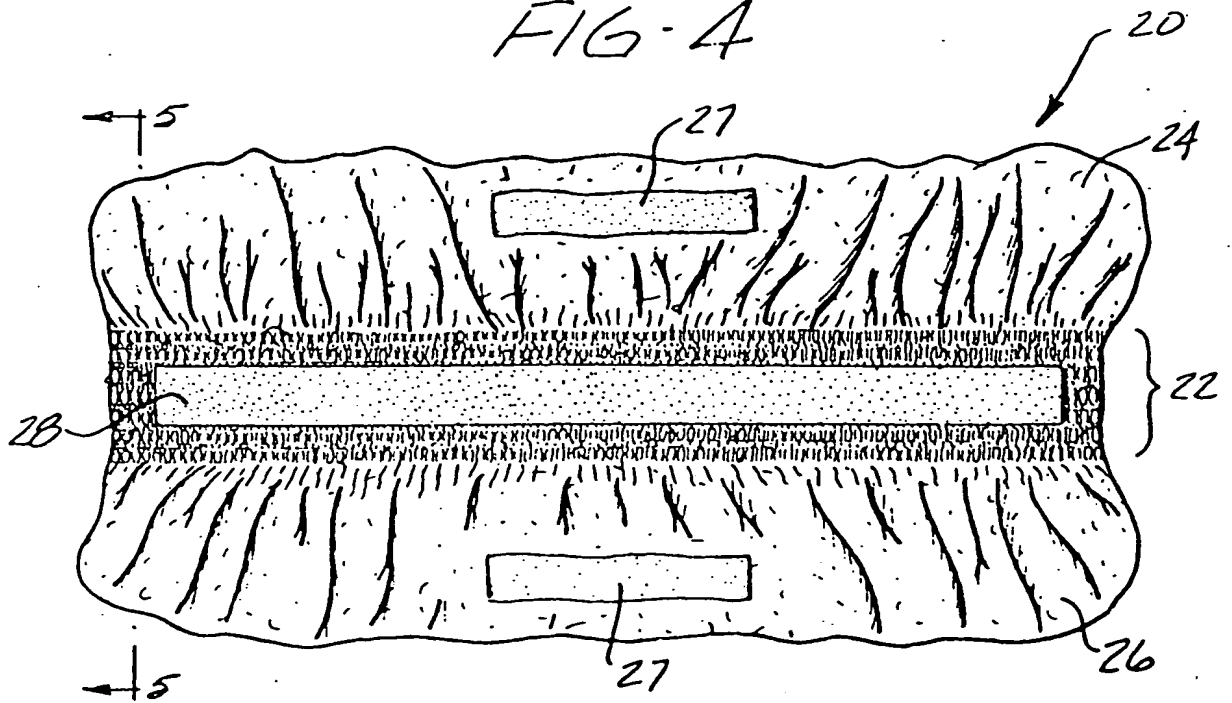
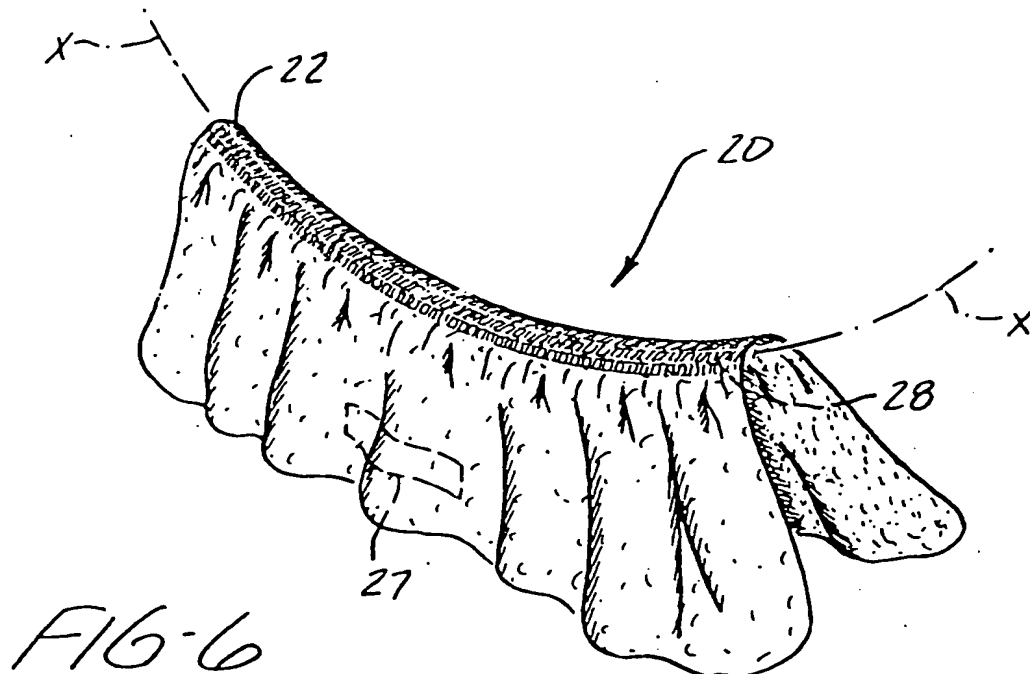
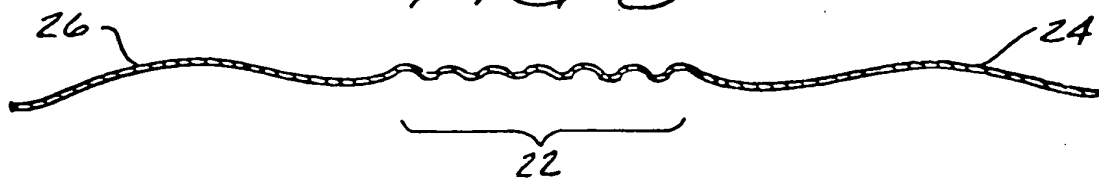


FIG-5




PANTS LINER FOR ATTACHMENT  
DIRECTLY TO OUTER GARMENT

A B S T R A C T

5           Conformable, absorbent articles for use in the crotch  
portion of a garment having tubular leg portions are disclosed  
which are used to make pants liners (20) which may be attached  
10           directly to an outer garment, such as a pair of slacks (10). The  
present invention discloses pants liners which may be worn when  
the user does not wear an undergarment. In a preferred  
embodiment, a fabric structure is provided having a centrally  
disposed longitudinal portion (22) which has been microcreped,  
15           i.e., a series of small convolutions have been formed in the  
fabric. Extending laterally from the microcreped portion are  
conformable ruffled portions (24, 26) which conform to the crotch  
portion of a garment, and lie along the inner surface of the leg  
portion without undue bunching or folding. Methods of making  
such liners are also disclosed.

20           (Most illustrative drawing : Figure 4)

  
KEMENTERIAN PERDAGANGAN DALAM NEGERI  
DAN HAL EHWAL PENGGUNA MALAYSIA.  
BAHAGIAN HARTA INTELEK.  
TINGKAT 22.  
MENARA MAYBANK.  
100 JALAN TUN PERAK.  
50050 KUALA LUMPUR

*Ministry of Domestic Trade and Consumer Affairs Malaysia,  
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APPLICATION NO : PI 9002063

APPLICANT : MCNEIL-PPC, INC.

FILING DATE : 22 NOVEMBER 1990

APPLICANT'S OR AGENT'S FILE REF : SD/PAT/1197904/HD

REF. APPLICANT'S LETTER DATED : 19 NOVEMBER 1993 &  
25 FEBRUARY 1994

**SUBSTANTIVE EXAMINATION - CLEAR REPORT**

Please find attached a copy of the Examiner's report under  
Section 30(2) of the Patents Act.

Date : 23 APR 1994

  
M.D. AMBAN B. ABAS  
Registrar of Patents



To : The Registrar of Patents

APPLICATION NO : PI 9002063

APPLICANT : MCNEIL-PPC, INC.

REF. APPLICANT'S LETTER DATED : 19 NOVEMBER 1993 &  
25 FEBRUARY 1994

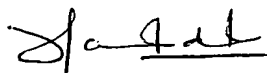
SUBSTANTIVE EXAMINATION - CLEAR REPORT

I have further examined the above application in accordance with Section 30(2) of the Patents Act and report that the application complies with the requirements of the Act and Regulations. The examination was carried out on the following application documents:

Description :	Pages	<u>1 - 9</u>	filed on	<u>22 November 1990</u>
	Pages	<u>          </u>	filed on	<u>          </u>
	Pages	<u>          </u>	filed on	<u>          </u>
Claims :	Pages	<u>10</u>	filed on	<u>25 February 1994</u>
	Pages	<u>          </u>	filed on	<u>          </u>
	Pages	<u>          </u>	filed on	<u>          </u>
Drawings :	Figure	<u>1-6</u>	filed on	<u>22 November 1990</u>
	Figure	<u>          </u>	filed on	<u>          </u>
	Figure	<u>          </u>	filed on	<u>          </u>
Abstract :	Pages	<u>12</u>	filed on	<u>25 February 1994</u>
	Figure	<u>4</u>	filed on	<u>22 November 1990</u>

Date : 22 APR 1994

PRO 120A

  
Examiner of Patents  
HAMIDUN B. OMAR  
PATENT EXAMINER  
PATENT REGISTRATION OFFICE  
March 93

PATENT REGISTRATION OFFICE

APPLICATION NO:....PI.9002063.....

GRANT NO:.....MY-104766-A.....

DATE OF GRANT AND PUBLICATION:.....31 MAY 1994.....

OWNER:.....MCNEIL-PPC, INC. *Johnson - PPC 0281*.....

APPLICANT OR PATENT AGENT'S REFERENCE:.....SD/PAT/1197904/HD.....

~~NOTICE OF GRANT~~

The purpose of this notice is to advise you that a patent/utility innovation has been granted on the above application.

Please find enclosed a certificate of grant with a copy of the patent/utility innovation together with a copy of the Examiner's report in accordance with Section 31 2(a) of the Patents Act.

Copies of the patent/utility innovation were made available to the public on the date of grant. A reference to the grant will be published in the Gazette as soon as possible.

Your attention is drawn to the need to pay annual renewal fees in order to keep the patent/utility innovation in force (see Section 35(2) of the Patents Act and Schedule 1 of the Regulations).

Date:.....31 MAY 1994.....

*[Signature]*  
Registrar of Patents

To:

DATO V.L. KANDAN

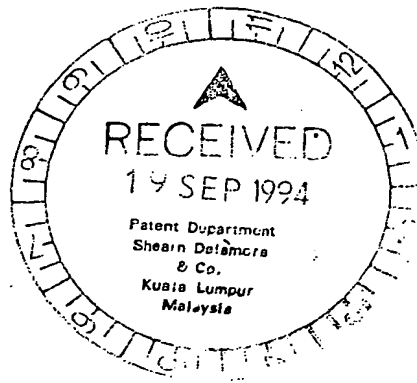
Name:.....

Address:.....c/o MESSRS. SHEARN DELAMORE & CO.,

NO. 2 BENTENG, 50050 KUALA LUMPUR.

.....

.....



REGISTER OF PATENTS - PAGE 2

MY-104 766-A

GRANT NUMBER: .....

MCNEIL-PPC, INC.

NAME OF OWNER: .....

ANNUAL FEES (Section 35(2))

Payable before expiration of	Amount due	Date -ue	Date paid	Date of Surrender.....
				Date of Lapse..... Date of Reinstatement.....
2nd year	100			Court Decisions Date of Decision..... Grant Invalidated Yes <input type="checkbox"/> No <input type="checkbox"/> Statutory Ground of Invalidation..... Extent of Invalidation..... Other Details:
3rd year	150			
4th year	200			
5th year	200			
6th year	250			
7th year	250			
8th year	300			
9th year	300			
10th year	350			
11th year	400			
12th year	600			
13th year	700			
14th year	800			
15th year	1000			

Note 1. For a patent the first fee (2nd year) is payable before the first anniversary of the date of grant.

Note 2 For a utility innovation the first fee (3rd year) is payable before the second anniversary of the date of grant.

Note 3 An extension of time of 6 months is obtainable upon payment of the prescribed fee.

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